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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Ronald Hepper

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EXAMINER

CORMIER, DAVID G

ART UNIT

PAPER NUMBER

1792

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DELIVERY MODE

10/01/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/596,406	Applicant(s) HEPPER ET AL.	
	Examiner DAVID CORMIER	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 35-60 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 35-60 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>03092007</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

1. The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code in paragraph 60 of the specification. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

Claim Objections

2. Claim 42 is objected to because of the following informalities: it recites the phrase "during a or the cleaning operation" which appears to have some grammatical error. Appropriate correction is required.

3. Claims 42 and 55 are objected to because of the following informalities: they recite the phrase "conditioned purge gas or the conditioned purge gas" which is repetitious. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 35-60 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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6. Regarding Claims 36, 38, 39, 41, 45, 46, 47, 48, 51, 54, 56 and 57, the term "preferably" renders the claims indefinite because it is unclear whether the limitations following the term are part of the claimed invention. See MPEP § 2173.05(d).
7. Regarding Claims 35, 36, 37, 38, 40, 42, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 58 and 59, the phrase "in particular" renders the claims indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).
8. Claims 59 and 60 recites the limitation "the at least one conditioning device," which lacks proper antecedent basis because, in the claim from which it depends, the at least one conditioning device is an optional limitation
9. Claim 60 recites the limitation "the substrate drying apparatus," which lacks proper antecedent basis because, in the claim from which it depends, the substrate drying apparatus is an optional limitation.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section

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351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 35, 36, 40-43, 49 and 52-55 are rejected under 35 U.S.C. 102(b) as being anticipated by Doley et al. (US 2001/0000759).

12. Regarding Claim 35, Doley discloses a method for cleaning a substrate handling chamber for coating at least one substrate (paragraph 1), wherein the at least one process chamber is purged with a conditioned purge gas prior to a coating operation (paragraphs 28, 31 and 36).

13. Regarding Claims 36 and 40, Doley discloses that the purge gas could be a dry nitrogen gas (paragraph 29), which is considered to be essentially free of moisture and reads on a predetermined moisture level because a predetermined moisture level reads on any preset moisture level. A dry nitrogen gas would also arguably read on a moisture level at about zero percent humidity. Furthermore, the nitrogen gas is considered to be an inert gas.

14. Regarding Claim 41, Doley discloses that during a cleaning operation the conditioned purge gas flows through the at least one process chamber (paragraph 36).

15. Regarding Claims 42, 43, 49 and 50, Doley discloses that there is a pressure lock (14, 15) arranged at an entry/exit of the at least one process chamber that is purged with conditioned purge gas before and while the substrates are loaded in the pressure locks (paragraphs 28 and 29). Doley also discloses that the process chamber is used for a coating process, "epitaxial reactor" (paragraphs 17 and 27).

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16. Regarding Claim 52, Doley discloses an apparatus having a process chamber (20) and at least one purge device (22).

17. Further regarding Claim 52, the phrases "for cleaning at least one process chamber," "for coating at least one substrate" and "for introducing...prior to a coating operation" are considered to be intended use of the apparatus as taught by Doley and are not being given patentable weight. The claimed intended use must result in a structural difference between the claimed invention and the prior art in order to distinguish the claimed invention from the prior art.

18. Regarding Claims 53 and 54, Doley discloses the at least one purge device having at least one purge gas feed line (12, 24, 26 or 28) and at least one purge gas delivery unit (this reads on, for example, the valves, 18 or 95, the dome regulator, 90, the damper, 44, and orifice, 46, or the Bernoulli wand, 36). Any of these valves, regulators or orifices would also read on the conditioning device provided for setting a pressure of the purge gas, as claimed in Claim 54.

19. Regarding Claim 55, Doley discloses a feed device (24) for introducing gas (introducing conditioned gas is considered to be intended use of the apparatus, even though the gas can be considered as conditioned by at least the ionizers, 21a and 21b) into at least one pressure lock arranged at an entry/exit of the process chamber (14 and 15). The phrase "for coating at least one substrate" is considered to be intended use of the process chamber.

20. Regarding all of the claims, the limitations that follow the phrases "in particular" and "preferably" are being interpreted as optional limitations and are not being given

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patentable weight, even though some of those limitations are met by the method and apparatus as taught by Doley. Also note that many claims claim multiple embodiments by using the phrase "and/or" and that only one of these alternatives must be shown by the prior art to anticipate the claim.

21. Claims 35, 37, 44, 52-54 and 56 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. (US 2002/0045966).

22. Lee discloses an apparatus and method for cleaning a CVD process chamber (40). Prior to a coating operation, the chamber is purged with a mixture of an etching and an inert gas (paragraphs 29 and 30, Figure 3). The gases are supplied from the gas supply part (58 and 62) through lines (54, 54a) to a plasma device (56) that excites and filters the gases prior to their entry to the chamber (paragraphs 29 and 30). The process chamber is at least partially heated during a CVD process with a heater (42; paragraph 27), which reads on apparatus Claim 56. The valves (64, 60a, 60b), gas mixer (46) and shower (44) read on a purge gas delivery unit.

23. Further regarding Claim 52, the phrases "for cleaning at least one process chamber," "for coating at least one substrate" and "for introducing...prior to a coating operation" are considered to be intended use of the apparatus as taught by Lee and are not being given patentable weight. Further regarding Claim 56, the phrase "for the purpose of heating...before and/or during a cleaning operation" is considered to be intended use and is not being given patentable weight. The claimed intended use must result in a structural difference between the claimed invention and the prior art in order to distinguish the claimed invention from the prior art.

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24. Regarding all of the claims, the limitations that follow the phrases "in particular" and "preferably" are being interpreted as optional limitations and are not being given patentable weight, even though some of those limitations are met by the method and apparatus as taught by Lee. Also note that many claims claim multiple embodiments by using the phrase "and/or" and that only one of these alternatives must be shown by the prior art to anticipate the claim.

25. **Claims 35, 38, 39, 40, 47, 50-54, 56 and 58 are rejected under 35 U.S.C. 102(a and e) as being anticipated by Grosenbacher (US 6,596,091).**

26. Grosenbacher discloses an apparatus and method for cleaning a PVD process chamber (10) prior to a deposition step by purging the chamber with an ultra high purity inert gas from a cylinder (26) (col. 2, lines 55-65; col. 3, lines 42-44 and 66). The purge gas is flowed through lines (Figure 1), valves (30, 38, 22) and a mass flow controller (34) (the valves and mass flow controller read on the conditioning device for setting a pressure, as in Claim 54) then into the chamber in multiple cycles at a temperature of below about 50 °C and then in cycles at a temperature of above 90 °C (col. 3, lines 11-33). During the 50 °C cycles, the purge gas is at a predetermined pressure of below about 4 Torr, and during the 90 °C cycles, the purge gas is at a predetermined pressure of about 2.4 to 3.6 Torr (col. 3, lines 11-33), which reads on Claim 39 because the claimed pressure range is deemed to be an optional limitation. After the purging steps and before the processing step, the chamber is heated at a temperature above about 90 °C (col. 3, lines 27-32). The high vacuum pump continues to pump down the pressure of the chamber after the cleaning step (col. 3, lines 38-40). A temperature probe (42),

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pressure gauge (44) and ion pressure gauge (46) are used to monitor the process chamber.

27. Further regarding Claim 52, the phrases "for cleaning at least one process chamber," "for coating at least one substrate" and "for introducing...prior to a coating operation" are considered to be intended use of the apparatus as taught by Grosenbacher and are not being given patentable weight. Further regarding Claim 56, the phrase "for the purpose of heating...before and/or during a cleaning operation" is considered to be intended use and is not being given patentable weight. The claimed intended use must result in a structural difference between the claimed invention and the prior art in order to distinguish the claimed invention from the prior art.

28. Regarding all of the claims, the limitations that follow the phrases "in particular" and "preferably" are being interpreted as optional limitations and are not being given patentable weight, even though some of those limitations are met by the method and apparatus as taught by Grosenbacher. Also note that many claims claim multiple embodiments by using the phrase "and/or" and that only one of these alternatives must be shown by the prior art to anticipate the claim.

29. **Claims 35, 46, 52, 59 and 60 are rejected under 35 U.S.C. 102(b) as being anticipated by Kubota (US 6,461,437).**

30. Kubota discloses a method and apparatus for purging a CVD chamber (2) with a gaseous nitrogen or dry air (col. 5, lines 26-42) through gas lines (see Figure 6). Prior to the CVD process, the substrate is pretreated/cleaned (col. 7, lines 28-58; Figure 6). Regarding Claims 59 and 60, Kubota shows a conditioning device (7) connected to both

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the CVD load lock and the load lock for the substrate cleaning chamber (44), and this conditioning device reads on a “conditioning device of a substrate treatment apparatus connected upstream of the at least one process chamber” because the load lock (45) and wafer cleaning chamber (44) are considered to be a substrate treatment apparatus. Those limitations following the phrases “in particular” and “preferably” are considered to be optional and are being given no patentable weight.

Claim Rejections - 35 USC § 103

31. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

32. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

33. **Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grosenbacher (US 6,596,091) in view of Ushikawa (US 5,378,283).**

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34. Grosenbacher is relied upon as applied to Claims 35, 38, 39, 40, 47, 50-54, 56 and 58.

35. Grosenbacher does not expressly disclose that the purge gas is passed through a circuit or closed loop and in which preferably the purge gas which emerges from the at least one process chamber is conditioned with regard to the moisture content and/or the loading with foreign substances and/or the temperature and/or the pressure and/or the gas composition.

36. Ushikawa discloses a CVD apparatus (1) with a load lock chamber (11) into which an inert gas is supplied (col. 4, lines 20-67). The load lock chamber has a gas recycling/re-circulating system (40) with a filter (43) for continually cleaning the inert gas in the load lock chamber. The gas circulating system keeps the inert gas at a high purity through repeated use of the system (col. 5, lines 19-25).

37. Because it is known in the art to pass purge gas through a circuit or closed loop as taught by Ushikawa, and the results of the modification would be predictable, namely, an effective way of continually purifying the purge gas, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the re-circulating system present on the load lock chamber and process chamber of Grosenbacher.

38. The limitation that follows the phrase "preferably" is being interpreted as optional limitations and is not being given patentable weight, even though some of those limitations are met by the method and apparatus as taught by Grosenbacher in view of Ushikawa. Also note that the claim claims multiple embodiments by using the phrase

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"and/or" and that only one of these alternatives must be shown by the prior art to anticipate the claim.

39. Claims 48 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grosenbacher (US 6,596,091) in view of Bennett et al. (US 5,387,777).

40. Grosenbacher is relied upon as applied to Claims 35, 38, 39, 40, 47, 50-54, 56 and 58.

41. Grosenbacher does not expressly disclose at least one pulse generator device, which before and/or during a coating operation, transmits at least one mechanical pulse to a process chamber wall.

42. Bennett discloses a plasma reactor chamber (10) in which deposited materials are removed prior to processing by applying a mechanical stress to the apparatus (col. 15, line 14 to col. 17, line 30). Disclosed means of applying a mechanical stress are by mechanical shockwave, acoustic stress, ultrasonic stress, vibrational stress, thermal stress or pressure stress (col. 15, lines 45-58).

43. Because it is known in the art to apply a mechanical stress to a wafer processing chamber to remove particles from surfaces, and the results of the modification would be predictable, namely, an effective way of removing particles, it would have been obvious to one of ordinary skill in the art at the time of the invention to have a pulse generator device to apply a mechanical pulse to a process chamber to assist in loosening particles prior to a processing step.

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44. Those limitations following the phrases “in particular” and “preferably” are considered to be optional and are being given no patentable weight.

Conclusion

45. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID CORMIER whose telephone number is (571) 270-7386. The examiner can normally be reached on Monday - Thursday 8:30 - 6:00.

46. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

47. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael Barr/
Supervisory Patent Examiner, Art
Unit 1792

/DGC/

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David Cormier

09/29/2009